Countercyclical Policies Caused by Political Opportunism

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Abstract

US state governments produce overly optimistic revenue forecasts in order to circumvent constitutional balanced budget constraints (Boylan, 2008). Using a political forecast cycle model, this paper offers a theoretical explanation of how the government can improve its re-election chances by increasing spending prior to elections, thereby creating a budget cycle. Moreover, it is shown that the cycle becomes particularly virulent, if the government correctly anticipates a recession; political opportunism produces, unintentionally, countercyclical policies. Other results depend on the voting assumptions for uninformed voters (retrospective versus rational). The results also relate to the European discussion of (supra-) national fiscal rules.

JEL classification: D72, H68, E32

Keywords: opportunistic political budget cycles; deficit-financed transfers; fiscal rules; fiscal policy; political economy; behavioural macroeconomics.

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1 Introduction

The sovereign debt and banking crisis in the Eurozone revealed successful government attempts to manipulate the international public’s perception of a country’s fiscal situation. Greece and other European countries cheated to hide “excessive” public debt and/or deficits so that they could gain access to the European Monetary Union and/or fulfill the criteria laid out by the European Growth and Stability Pact. On a smaller scale, there is a history of budget forecasts which are distorted for political reasons, especially prior to elections. There are at least two motives for such forecast manipulations: (i) the government is overly optimistic (for instance, overestimates revenues) in order to have more room for maneuver prior to an election; (ii) the government is overly pessimistic (i.e. underestimates the budget balance) in order to show its competence by being able to do unexpected expansionary fiscal policies. The former view is supported, for instance, by Boylan (2008) with respect to optimistic revenue forecasts in US states from 1988 to 2004; and by Heinemann (2006) with respect to optimistic deficit forecasts for Germany’s federal budget from 1969 to 2003. Brück and Stephan (2006) posit that the Stability and Growth Pact may actually have spurred forecast optimism in the eurozone. Jong-A-Pin, Sturm and de Haan (2012) find evidence for both motives in an OECD sample from 1997 to 2006. Overall, there is evidence for both views, possibly with more support for the former.¹

¹ Bischoff and Gohout (2010) find optimistic deficit forecasts prior to elections in German states, though weaker evidence than found by Heinemann (2006) at the national level. Couture and Imbeau (2009) find evidence for a pre-election revenue bias (in Canadian provinces from 1986-2004), Paleologou (2005) for a pre-election expenditure and revenue, but not for a deficit bias (for UK budget forecasts from 1969 to 1995). Ohlsson and Vredin (1996) encounter partisan, but no electoral effects (for Swedish data from 1969 to 1993). Blackley and DeBoer (1993) claim that there is a “substantial bias in outlay proposals”, but not in economic forecasts or revenue estimates (for US federal budgets prior to 1989). Von Hagen (2010) finds evidence for pre-election budget balance errors in EU member countries for the period 1998-2004: the errors depend on institutional factors, but also represent budget optimism prior to elections. – To my knowledge no econometric study has been conducted for developing countries yet, but Kyobe and Dunninger (2005) claim that discretionary adjustments of forecast figures are certainly not uncommon. They report on the revenue forecasting practices in 34 low-income countries. Their study is based on a questionnaire circulated to IMF fiscal economists in 2003. While most countries score low on the quality and the accountability of the forecasting process, discretionary adjustments seem to be particularly severe in countries with low levels of governance. – A pessimistic growth forecast leading to unexpected tax revenues was also favoured by Dutch Finance Minister Gerrit Zalm (serving between 1994 and 2006). However, the resulting budget surplus was to be used exclusively for debt reduction according to the so-called Zalm standard.
Manipulations based on overly optimistic forecasts prior to upcoming elections create budget and deficit cycles referred to as “electoral forecast cycle[s]” (Brück and Stephan, 2006). Boylan (2008) argues that such political manipulations lead to deficits prior to elections despite constitutional balanced budget constraints being in place. Based on a panel data analysis for all 50 US states he provides evidence for pre-election revenue forecasts which are based on favourable estimates of the macroeconomic environment and unrealistic growth assumptions. Table 1 summarises his findings (while ignoring details, alternative regressions, and sensitivity analyses). The table depicts only some key variables which also happen to be significant at the 5% level (marked by **). It shows that the state government’s forecast error for revenue growth can largely be explained by economic variables (unemployment and income growth) as well as the forecasting error for personal income. However, state revenues grow on average by an additional 2.2% when the fiscal year starts (in most states on 1 July) in the year of the elections (in November). Boylan’s (2008) analysis also reveals significant coefficients for underreporting of pre-election state deficit figures, irrespective of the stringency of their constitutional balanced budget constraint.

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>State revenue growth forecast error</th>
</tr>
</thead>
<tbody>
<tr>
<td>State personal income forecast error</td>
<td>1.466 ** ( (0.257) )</td>
</tr>
<tr>
<td>Fiscal year starts during election year</td>
<td>2.205 ** ( (0.654) )</td>
</tr>
<tr>
<td>Unemployment</td>
<td>3.433 ** ( (0.515) )</td>
</tr>
<tr>
<td>Income growth</td>
<td>0.631 ** ( (0.105) )</td>
</tr>
<tr>
<td>Observations</td>
<td>254</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.722</td>
</tr>
</tbody>
</table>

Table 1: Boylan (2008, p. 420), Table 3, column 4 (summarised)

This paper offers a moral hazard explanation for politically motivated deficit making despite a constitutional balanced budget constraint. Based on a formal model, it shows how forecast manipulations can be used for achieving a pre-election fiscal expansion, thereby actually succeeding in improving re-election chances. The incumbent claims to fulfill the
balanced budget requirement *ex ante*, albeit based on overly optimistic growth and, thereby, exaggerated revenue forecasts. *Ex post*, it turns out – to the government’s mock surprise – that the budget cannot be balanced. The government machinations can only be effective because the incumbent can hide the forecast manipulations from the uninformed part of the electorate. The government conducts expansionary fiscal policies which help the incumbent to appear more competent. The fiscal manipulations including the resulting deficit are only revealed after the re-election of the incumbent.

The paper makes three contributions. First, it offers a theoretical explanation for Boylan’s (2008) findings. It does this by presenting a political forecast cycle (PFC) model which essentially boils down to a political budget cycle (PBC) model. The ingredients of the model are several stylised facts: (i) the empirical relevance of forecast manipulations; (ii) the empirical evidence of the positive effect of fiscal manipulations on re-election chances (see two paragraphs below); (iii) the existence of non-fully rational voting by uninformed voters (to be discussed in Section 4; see also two paragraphs below); and (iv) the importance of transfers in fiscal manipulations (see Footnote 3). Overall, the paper argues that a constitutional balanced budget constraint does not prevent deficit making, albeit, possibly, avoid the build-up of long-term debt. In election years, an incumbent can use forecast manipulations to justify deficit-financed transfers despite the presence of a constitutional budget constraint. As debt is costly, it will be repaid in off-election years, thereby producing political budget cycles. This PFC model is based on the same mechanism as PBC models; politicians’ manipulations are aimed at expanding the budget in order to increase re-election chances.

As for the second contribution, the paper studies the impact of recession expectations. If the perceived state-specific economic growth prospects change, the incumbent will adjust her state-specific forecast manipulation. However, the forecast adjustment will be smaller than the change in her state-specific (honest) growth expectations. If a government’s state-specific recession expectation comes true, the deficit increases. If a government’s state-specific boom expectation comes true, the deficit is reduced. In either case, opportunistic
government behaviour leads to countercyclical policies, though not with that intention in mind. Nonetheless, this is good news, in particular in the case of pessimistic expectations by the government; opportunistic government behaviour has a stabilising effect on the economy. This also corroborates Boylan’s (2008) suspicion that ”government officials can avoid choosing between raising taxes and cutting government programs by making optimistic forecasts when the economy is headed for a downturn.” That such expected recessions increase the forecast and budget cycle is a new theoretical finding, which can, in principle, be tested empirically.

The third contribution builds on questioning the validity of the rational expectations assumption made for uninformed voters – as is, for instance, maintained by Shi and Svensson (2006). In Section 4, it is argued that there is a conceptual problem, if informed and uninformed voters come to the very same conclusions in equilibrium, although no information can be transmitted between them. I propose to treat such uninformed voters as potentially biased agents. The paper, therefore, does not only allow rational voting (fully expecting the incumbent’s manipulations), but also retrospective voting (based on the incumbent’s current performance without understanding that it is due to manipulations); any combination of these two extremes is also permitted. Retrospective and rational voting are introduced in Section 2 and dealt with in the General Solution of Section 3. Introducing retrospective besides rational voting allows us to contradict key features and findings of Shi and Svensson (2006) and to extend the scope of findings. Now, it can also be shown that economic machinations positively influence re-election chances which is an empirical finding by, for instance, Akhmedov and Zhuravskaya (2004) and Aidt, Veiga and Veiga (2011).

The remainder of the paper is structured as follows. The model is outlined in Section 2. Its general solution in Section 3 shows the similarities to political budget cycle models, but also that the winning probability can be affected by political manipulations. Details for the solution are given in appendices A-C. Section 4 discusses retrospective versus rational voting and presents Propositions 1 and 2. Section 5 focuses on changing recession expectations (Proposition 3) and their theoretical and empirical implications. Section 6 concludes.
2 An Electoral Forecast Cycle Model

In the following model, the incumbent government faces a constitutional balanced budget constraint as currently in place in all US states but Vermont, in Swiss cantons, and, progressively, also in German states. In such a situation, a government’s fiscal latitude can only be increased, if government revenues are expected to improve. In principle, the government has two options: raising tax rates and/or predicting a higher tax base. The major drawback of the former is that tax rate increases cannot be concealed and that they are not popular with most electorates in the US and elsewhere, especially prior to elections. The advantage of the latter is that forecasts of higher tax revenues do not receive so much attention, especially on the state level (and if they do, it is not seen as a negative signal). If the forecasts are not observed by all voters, the government can exert a hidden effort by using the additional receipts for expansionary fiscal policy. This is the focus of this paper.²

In the model, the prediction of a higher tax base is captured by forecasting a higher growth rate of the economy. Boylan (2008, p. 414) thinks there is a lot of scope for manipulation at the state level: ”the executive is likely to have the upper hand in determining the forecasts ... in 44 states the governor directly appoints the budget director.” In the following, it is, therefore, assumed that the government can not only influence, but even control the growth forecast made by the budget office. In the model, the growth forecast by the state is measured as deviation from national growth (normalised to zero for simplicity). So, such a state-specific growth forecast (henceforth sometimes simply growth forecast) can be used as the government instrument for expanding the state’s fiscal latitude and, ultimately, for affecting the incumbent’s re-election chances. Specifically, the government will use its fiscal latitude for increasing state-specific transfers (henceforth, synonymously, also (additional) state transfers). The focus on transfers is motivated by the empirical evidence³; but it also

² Ignoring tax rate increases could also be justified by making a formal argument as in Shi and Svensson (2006). They obtain the optimal tax rate for the ”equilibrium without elections” and then use backward induction in the 2-period election cycle to argue that the very same tax rate remains optimal. Moreover, there may be restrictions on changes of state tax rates. German states, for instance, do not even have the right to adjust their own tax rates.

³ The notion of cycles in public expenditures and, particularly, transfers is supported by, for instance,
allows for a relatively simple model structure.

The incumbent state government faces (or enjoys) a moral hazard problem because a share of voters is uninformed about economic forecasts for the state. This argument is, arguably, more convincing in a state-level (rather than national) setting because voters may be much more aware of national forecasts. The state government can thus exert a hidden effort in order to appear more competent. An opportunistic incumbent will produce an overly optimistic state-specific growth forecast, thereby giving room for expanding state transfers before the elections. By cutting state transfers or raising taxes, the ensuing (costly) state deficit (henceforth simply deficit) can be repaid after the elections, thereby producing a deficit and debt cycle as found, for instance, by Alesina, Cohen and Roubini (1992 and 1993) and confirmed by Drazen (2001). Informed and uninformed voters know about the economic conditions nation-wide. But only informed voters can observe the state-specific growth forecast used by the state government as the basis for its budget plan. By contrast, uninformed voters are not able to learn about that forecast; or they are not interested in it (or they are not able to link the forecast to the government’s economic policies). The point is that a share of the electorate does not observe the state-specific growth forecast, but may or may not (see next paragraph) have a sense of how much the incumbent manipulates its fiscal position for appearing more competent.

Informed voters have perfect knowledge and there is no reason why they should not vote rationally. It is not so clear, however, how to deal with the voting behaviour of uninformed voters. The paper studies two extreme views explicitly: (i) retrospective voting; and (ii) rational voting. More realistic solutions are probably somewhere in between and can be considered linear combinations of the extremes. In fact, Ursprung (1994, p. 279) concludes for his model of political propaganda that uninformed voters cannot be completely manipulated. Both extremes have unattractive features; retrospective voting entails total naivety on the part of uninformed voters; rational voting implies that informed and uninformed

voters reach the same conclusion in equilibrium despite different information sets (see Section 4). (The pure form of) retrospective voting by uninformed voters means that a share of the electorate falsely attributes the improved fiscal position of the state government to competence of the incumbent. This entails that uninformed voters judge the incumbent on the basis of her current performance and do not suspect any manipulation. This also implies that they think that the incumbent will form a realistic state-specific growth forecast which should be zero on average, if we assume that the mean of the state-specific growth shock is zero. By contrast, rational voting by uninformed voters implies that they can form rational expectations of the incumbent’s state-specific growth forecast. However, even under rational voting the incumbent will manipulate her growth forecast because uninformed voters suspect the manipulation. Uninformed, but rational voters know that the incumbent could appear more competent by manipulating the growth forecast (which cannot be observed by uninformed voters). The incumbent is trapped and must do the manipulation in order not to forfeit her re-election chances.

Preferences

Every alternate period an incumbent politician and a challenger representing two different parties run for office. The politicians’ motivation is purely opportunistic. Nonetheless, voter utility does not hinge on economic considerations alone, but also on a more or less strong personal predisposition or sympathy for one of the candidates.\(^4\) The utility function for any voter \(i\) reflects both economic and non-economic components:

\[
U^i = \sum_{s=t}^{\infty} E_s [c_s + \alpha \theta^i z_s].
\]  

The economic component \(c_s\) (consumption) and the sympathy component \(\theta^i z_s\) are additively-separable with relative weight \(\alpha\) in each period. Discounting between periods could be

\(^4\) Henceforth the terms voter and individual (agent) are used interchangeably. Similarly, the terms politician and policymaker are used as synonyms. Furthermore, we associate the incumbent (sometimes also referred to as government) with party \(a\) and the challenger with party \(b\) without limiting the generality of the analysis.
added, but does not contribute to substance nor exposition. To keep the model tractable, another simplification is that utility is linear in consumption. Utility derived from sympathy is constrained to $\theta^i z_i \in [-\frac{1}{2}, \frac{1}{2}]$ since $z_i$ is either $-\frac{1}{2}$ (when party $a$ is elected) or $+\frac{1}{2}$ (when party $b$ is elected); and the personal sympathy parameter $\theta^i$ is uniformly distributed over the interval $[-1, 1]$. The sympathy component represents any attribute of the candidates that does not affect economic policies, be it their stance on societal issues or their good looks.

Both politicians $j = a, b$ face a utility function similar to the one for voters consisting, again, of an economic and, if the politician is in power, a non-economic component. The non-economic component is, however, different and includes both a political rent and a political (reputation) cost. Assuming, without loss of generality, that $a$ is in power and $b$ not, the politicians’ utility functions are thus:

$$V^a = \sum_{s=t}^{\infty} V_s^a = \sum_{s=t}^{\infty} E_s[c_s + X_s - \xi_s D_{s-1}^2]\quad V^b = \sum_{s=t}^{\infty} E_s[c_s].$$

Both policymakers are concerned about consumption. In addition, politician $a$ (in power) receives ego rent $X_s$ and bears reputation costs ($\xi_s D_{s-1}^2$), if she was also in power in the previous period. The reputation costs rise overproportionally (squared) with the previous period violation ($D_{s-1} > 0$) of the constitutional balanced budget constraint (requiring $D_{s-1} \leq 0$).

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5 Linear utility in private consumption has been used before, when it does not affect the key mechanism, for instance, in Battaglini and Coate (2008). The more standard assumption of making private and public goods consumption additively-separable and imposing a constant marginal utility on public goods (used, for instance, by Shi and Svensson, 2006) can, arguably, be more problematic, because it is sometimes not clear how that assumption actually affects the results.

6 If individual $i$ has somewhat more sympathies for party $a$, say at $\theta^i = -\frac{1}{2}$, then her utility derived from sympathy is positive ($\frac{1}{4}$), if party $a$ is elected ($z_i = -\frac{1}{2}$); but it is negative ($-\frac{1}{4}$), if party $b$ is elected ($z_i = \frac{1}{2}$).

7 Leaving reputation costs out would not contradict any of the findings of this paper, but would require the inclusion of agents’ discount rates and a careful discussion of interest (debt repayment) versus discount rates (agents’ utilities). The quadratic form is the simplest way of capturing how the government’s trustworthiness and credibility are affected. The legislature and social groups, the government has to deal with, may “tolerate” small, but not large, deviations and dislike both surpluses and deficits.
Fiscal policy and competence

Voters’ and politicians’ period $t$ consumption $c_t$ alike is constrained by nation-wide (per person) income $y_t$; each agent’s additional net-of-tax income $(1 - \tau)\epsilon_t y_t$ due to state-specific growth rate shock $\epsilon_t$; and period-specific additional state transfers $T_{t^+}^s$:

$$c_t = y_t + (1 - \tau)\epsilon_t y_t + T_{t^+}^s.$$  (3)

Tax rate $\tau$ is taken to be constant and national (per person) income $y_t$ may vary, but they are both exogenous. All voters observe the fluctuations of the national average income $y_t$, but not the state-specific deviation. Growth rate shock $\epsilon_t$ is a random variable with mean $E_t[\epsilon_t] = 0$ and variance $\sigma^2$. The additional state-specific transfers depend upon fiscal latitude $L_t$ minus repayment for last period’s deficit $(1 - r)(D_{t-1})$, modulo the incumbent’s positive or negative competence shock, $\eta_{jt}$.

$$T_{t^+}^s = L_t - (1 + r_{t-1})(D_{t-1}) + \eta_{jt};$$  (4)

$$L_t = \tau \epsilon_t^a y_t.$$  (5)

Fiscal latitude is determined by the state government’s forecast $\epsilon_t^a$ of state-specific growth rate shock $\epsilon_t$. The variable $\epsilon_t^a$ is incumbent a’s instrument and forms the basis for her budget calculations. National interest rate $r_{t-1}$, constant and known by everybody, determines the repayment costs for any level $D_{t-1}$. If we think of states without large debt due to the constitutional balanced budget constraint, the rate at which the state government can borrow money should not carry a state-specific risk premium. Hence the interest rate is assumed to be exogenous, though not necessarily constant across periods.

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$^8 T_{t^+}^s$ may be interpreted as transfers facilitated by the state government on top of what is normally provided. Arguing along these lines, equation (3) can be obtained by assuming that the normal level of transfers matches the taxes on nation-wide (per person) income $y_t$ as follows: $c_t = (1 - \tau)(1 + \epsilon_t)y_t + T_{t^+}^{all}$; with $T_{t^+}^{all} = T_{t^+}^{normal} + T_{t^+}^s$ and $T_{t^+}^{normal} = \tau y_t$. Note that deadweight loss and distributional effects are ignored.
Competence could be interpreted, for instance, as tax collection efficiency or transfer allocation efficiency. Competence $\eta_{jt}$ consists of a skills shocks for the current period and another one for the previous period:

$$\eta_{jt} = \mu_{jt} + \mu_{j,t-1}. \quad (6)$$

Hence competence persistence is modelled as an MA(1) process.\(^9\) Each skills shock $\mu_{jt}$ is a random variable with mean 0, distribution function $F(\mu_{jt}) = F(\bullet)$ and density function $f(\mu_{jt}) = f(\bullet) = F'(\bullet)$ which is (weakly) monotonously increasing up to the mean.\(^10\) Past shocks are common knowledge, but current or future shocks are unknown to both policymakers and private agents. Even the incumbent does not know her own current competence – an idea suggested by Shi and Svensson (2006) – because she always faces new tasks and challenges (like the financial crisis) or wants to start new programmes and cannot foresee how efficiently she can manage them. Not knowing her own competence, any incumbent has an incentive to provide additional state transfers in order to appear more competent and increase her re-election chances. Since policymakers do not have an informational advantage, there is no signalling, only moral hazard.

Additional state-specific transfers are actually deficit-financed intertemporal transfers, not income redistribution. State deficits are constitutionally prohibited, but can (and typically

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\(^9\) Limited persistence is a compromise. It allows some persistence while acknowledging that competence also changes over time as new tasks for politicians emerge. For persistence longer than 1 period, the model would not be easily solvable. Rogoff and Sibert’s (1988) and Rogoff’s (1990) suggestion of an MA(1) process is one of two conditions (the other being the aforementioned assumption of debt nmbeing costly) for splitting the model into separate 2-period cycles as is common in this literature. Each cycle consists of an election period and an off-election period. The timing of events (page 11) and the role of these assumptions is outlined further down. – The strategic implications in an explicitly intertemporal setting are brought out by Milesi-Ferretti and Spolaore (1994). – In a partisan model of the political business cycle such as Blomberg and Hess (2003), the role of competence is to enable the government to conduct its partisan policies in the most beneficial way, i.e. to cut taxes without large spending cuts, if it is a right wing government, or to raise public services without large tax increases, if it is a left wing government. – If higher competence means better policies, Caselli and Morelli (2004) go one step further. In their opportunistic political business cycle model, they argue with Plato that “the city where those who rule are least eager to do so will be the best governed”. This is so because competent policymakers have more outside options.

\(^10\) For more unusual density functions (for instance, with $F''(\mu_{at}) < 0$ for some $\mu_{at} \leq 0$), we could get ambiguous results. However, the limiting case of $F''(\mu_{at}) = 0$ for some $\mu_{at} \leq 0$ or even over the entire range (uniform distribution) is acceptable.
will) appear, because the incumbent has an incentive to increase her fiscal latitude by raising her state-specific growth forecast above the state-specific growth rate shock expected by her. If the realised state-specific growth rate shock turns out to be greater than expected, there may be a surplus instead of a deficit. This can be seen from the government budget constraint which is obtained residually; the realised deficit (not expected deficit) is defined as realised government expenditures minus realised government revenues. In our model, this corresponds to realised state-specific transfers $T_s^{t+}$ according to equations (4) and (5), but excluding the competence shock (which, if positive, only increases transfers costlessly), minus realised taxes $(\tau \epsilon_t y_t)$:

$$D_t \equiv \tau \epsilon_t^a y_t - (1 + r_{t-1})(D_{t-1}) - \tau \epsilon_t y_t$$

$$= \tau (\epsilon_t^a - \epsilon_t) y_t - (1 + r_{t-1})(D_{t-1}).$$

(7)

From the perspective of the incumbent (which is relevant when obtaining her optimal state-specific growth forecast\(^{11}\)) the expected deficit in election period $t$ is typically positive:

$$E_t^{\ast}[D_t] = \tau (\epsilon_t^a - E_t^{\ast}[\epsilon_t]) y_t - (1 + r_{t-1})(D_{t-1}).$$

(8)

With its state-specific growth forecast $\epsilon_t^a$ the government hopes to facilitate additional state transfers (equations 4 and 5), thereby accepting (and expecting) a positive deficit. This is so, when the government has average growth expectations for the state, i.e. $E_t^{\ast}[\epsilon_t] = E_t[\epsilon_t] = 0$. However, later on we relax this assumption. Proposition 3 considers a perturbation of $E_t^{\ast}[\epsilon_t]$.

### Timing of events

In election period $t$, the incumbent chooses state-specific growth forecast $\epsilon_t^a$, thus determining her fiscal latitude $L_t$ and providing additional state transfers $T_s^{t+}$ for the public.

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\(^{11}\) Note that state-specific growth rate shocks appear in three, their forecasts in two different forms. Growth rate shock $\epsilon_t$ is a random variable with expectational value $E_t[\epsilon_t]$: expectations by the incumbent $E_t^{\ast}[\epsilon_t]$ may differ. Growth forecast $\epsilon_t^a$ refers to the manipulated forecast used by the government to justify its fiscal policy. Uninformed voters’ perception of the state government’s forecast is denoted by $\hat{\epsilon}_t^a$. 
according to equations (5) and (4), respectively. Voting individuals observe $T_{t}^{s+}$, last period’s deficit $D_{t-1}$ and past skills shock $\mu_{t-1}^{a}$. Only informed voters (share $(1 - \psi)$ of all voters; $0 \geq \psi \geq 1$) also observe the state government’s policy choice of state-specific growth forecast $\epsilon_{t}^{a}$. They can, therefore, deduce current skills $\mu_{t}^{a}$, thereby extracting information about the future competence of the incumbent. Uninformed voters can only form expectations of the incumbent’s current skills, $\mu_{t}^{a}$ based on their perception of the government growth forecast, $\epsilon_{t}^{a}$. The paper considers two extreme cases (but also a linear combination thereof). Either uninformed agents vote retrospectively; they naively expect no forecast manipulation which means that they expect the mean of the state-specific growth shock: $\epsilon_{t}^{a} = E(\epsilon_{t}) = 0$. Or uninformed agents are rational voters who form rational expectations.

Then, uninformed voters (whichever type of voting or combination thereof is considered) and informed voters cast their votes based on their different beliefs and information sets. What matters is that a share of voters $\psi$ is uninformed, be they rational or retrospective voters. If government policy could be observed by all voters, the government would gain nothing from manipulating the forecast and from expanding state-specific transfers.

<table>
<thead>
<tr>
<th>Incumbent a:</th>
<th>All voters observe:</th>
<th>Informed voters:</th>
<th>The winner of the period $t$ elections takes office and receives an ego rent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- chooses state-specific growth forecast $\epsilon_{t}^{a}$</td>
<td>- additional state-specific transfers $T_{t}^{s+}$</td>
<td>- deduce the incumbent’s current period skills $\mu_{t}^{a}$</td>
<td>If the incumbent stays in office, she suffers a reputation loss, if the balanced budget constraint was violated in period $t$.</td>
</tr>
<tr>
<td>- and provides additional state-specific transfers $T_{t}^{s+}$</td>
<td>- last period’s deficit $D_{t-1}$</td>
<td>- and vote.</td>
<td>The winner repays the deficit of the previous year.</td>
</tr>
<tr>
<td>Informed voters observe:</td>
<td>the incumbent’s last period skills $\mu_{t-1}^{a}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- the incumbent’s state-specific growth forecast $\epsilon_{t}^{a}$</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Figure 1: The Timing of Events
In period \((t+1)\), the winner (incumbent or challenger) takes office and receives an ego rent. If the incumbent stays in office, she also suffers a reputation loss amounting to disutility \(\xi_t D_{t-1}^2\) for having violated the balanced budget constraint. A government found to have cheated may be in a weaker position in negotiations with the legislature and social groups. However, voters are no longer relevant for the policymaker’s decision making in \((t+1)\) because they cannot vote in period \((t+1)\). State politicians have no incentive for manipulating their growth estimate \(\epsilon_t^a\). They want to repay the previous period deficit because the deficit is costly\(^{12}\) and voters cannot sanction the policymaker for reducing state-specific transfers. That means effectively levying additional taxes to finance the deficit repayment. Given that voters are only concerned about politicians’ competence after the election it does not matter that individuals anticipate in election period \(t\) that any politician will repay the deficit in the off-election period \((t+1)\). Note also that voters do not consider expected utility in \((t+2)\) in their voting decision in \(t\), because even informed voters cannot distinguish between the incumbent and her challenger in \((t+2)\) (competence is an MA(1) process only). Politicians, too, are not concerned about the more distant future, because they have no instrument for affecting utility or re-election chances in \((t+2)\). The model can, therefore, be split in 2-period cycles consisting of an election period (for instance, period \(t\)) and an off-election period (for instance, period \(t + 1\)). See also footnote 9.

### 3 The General Solution

The incumbent maximises her expected utility in \(t\) and \(t + 1\). The latter depends on the probability of the incumbent of winning the election. First, we must, therefore, determine the probability that an individual agent votes for incumbent \(a\). It depends on whether a voter expects the incumbent or the challenger to deliver a higher level of utility after the

\(^{12}\) Repayment is guaranteed for two reasons. Firstly, because of the aforementioned reputation loss. Secondly, technically, because the marginal utility of additional deficit-financed state transfers in \(t\) (through its 1-for-1 effect on period \(t\) consumption) is 1 (given that the discount factor is 1), whereas its marginal cost and, therefore, the marginal disutility is \((1 + r_t)\), i.e. greater than 1. The unity marginal utility assumption is also used by Shi and Svensson (2006) for the same purpose as here, albeit with respect to the public goods consumption.
elections, i.e. in $t + 1$. This depends on two components: (i) on the individual’s sympathy $\theta^i$ towards the candidates; and (ii) on who can deliver more state-specific transfers which, in turn, depends on the politicians’ skills in periods $t$ and $t + 1$. Agents do not know future skills of incumbent or challenger; nor can they observe any skills of the challenger in period $t$. However, they may have expectations on the incumbent’s skills ($E_t[\mu^a_t]$) based on her performance in office in period $t$. It is shown in appendix A that an individual agent votes for incumbent $a$, if the following inequality (which corresponds to (A.7)) holds:

$$E_t[\mu^a_t] > \alpha \theta^i.$$  

(9)

Even if incumbent $a$ is expected to be (slightly) less skilled than average, an individual will still vote for incumbent $a$, if the voter is sufficiently sympathetic towards the incumbent (remember that $\theta^i < 0$ indicates sympathy for party $a$ and $\alpha$ is a positive weight). Conversely, even if a voter is sympathetic towards the challenger ($\theta^i > 0$), the incumbent could still be chosen, if the incumbent is expected to exhibit sufficiently strong (above average) competence.

Second and on this basis, we can derive the probability for the incumbent to win the election (same as (B.1) in appendix B):

$$\text{Prob} \left\{ \begin{array}{l}
(1 - \psi) \left[ \frac{E_t^{\text{inf}}[\mu^a_t]}{2\alpha} + \frac{1}{2} \right] + \psi \left[ \frac{E_t^{\text{uninf}}[\mu^a_t]}{2\alpha} + \frac{1}{2} \right] \geq \frac{1}{2}
\end{array} \right\}.$$  

(10)

The probability depends on whether informed voters (share $(1 - \psi)$) and uninformed voters (share $\psi$) think that the incumbent’s skills are above average ($E_t[\mu^a_t] > 0$) or not. The difference for informed and uninformed voters occurs because informed voters have all the information for deducing $\mu^a_t$ from the period $t$ transfer equations (4) and (5); uninformed voters do not. Uninformed voters (irrespective of being rational or retrospective) do not observe state-specific growth forecast $\epsilon^a_t$; instead, they have to use their perception of the incumbent’s state-specific growth forecast $\hat{\epsilon}^a_t$. Hence, their mistake amounts to $\tau(\hat{\epsilon}^a_t - \epsilon^a_t)y_t$.
– as shown in appendix B. On this basis, we can derive the incumbent’s probability of winning \( \text{Prob}^{\text{win}} \) (identical to (B.5) and (B.6) in appendix B):

\[
\text{Prob}^{\text{win}} = \text{Prob}\left\{\mu^a_t \geq \psi \tau (\hat{\epsilon}^a_t - \epsilon^a_t) y_t\right\} = 1 - F\left[\psi \tau (\hat{\epsilon}^a_t - \epsilon^a_t) y_t\right],
\]

(11)

where \( F(\bullet) \) is the distribution function of the skills shock. Note that this equation shows that the incumbent can only increase her winning probability \textit{in equilibrium}, if uninformed voters do not rationally expect the government’s machinations. Unter rational expectations we obtain \( \text{Prob}^{\text{win}} = 1 - F[0] = \frac{1}{2} \) in equilibrium.

**Incumbent’s decision problem**

We can maximise the incumbent’s expected utility over any 2-period cycle, i.e. period \( t \) utility \textit{plus} period \((t + 1)\) utility in case of winning the election multiplied by the probability of winning (as determined in step 2) \textit{plus} period \((t + 1)\) utility in case of losing multiplied by the probability of losing:

\[
\max_{\epsilon^a_t} V = \max_{\epsilon^a_t} V^a_t + V^a_{t+1} =
\]

\[
\max_{\epsilon^a_t} E^a_t \left\{ y_t + (1 - \tau) \epsilon_t y_t + T^{s+}_t + X - \xi D^{2}_{t-1} \right\} + E^a_t \left\{ \text{Prob}^{\text{win}} \left[ y_{t+1} + (1 - \tau) \epsilon_{t+1} y_{t+1} + T^{s+}_{t+1} + X - \xi D^{2}_{t} \right] \right\} + E^a_t \left\{ (1 - \text{Prob}^{\text{win}}) \left[ y_{t+1} + (1 - \tau) \epsilon_{t+1} y_{t+1} + T^{s+}_{t+1} \right] \right\}.
\]

(13)

Appendix C offers a more explicit version (C.1) and a simplified version (C.2) of maximisation problem (13).

We can now characterise the government’s optimal choice of its state-specific growth forecast \( \epsilon^a_t \) with the first order condition (FOC). Again, an extended version is presented in equation
\[- r_t \tau y + [F'(\bullet) \psi \tau y] \left[ X - \xi (E_\alpha^a D_t)^2 \right] - [1 - F(\bullet)] \left[ 2 \xi \tau y (E_\alpha^a D_t) \right] = 0. \tag{14} \]

The first term, \((- r_t \tau y\), is the marginal direct net effect of the government’s state-specific growth forecast on deficit, which is negative, because deficit including repayment is costly. The growth forecast is optimally chosen by the government, when the negative marginal direct net effect on deficit (first term) equals the net effect on the expected return if the incumbent stays in power (second and third terms). The latter consists of countervailing effects. The second term depicts the positive marginal impact of higher forecasts on the perceived competence of the incumbent and thus on the voting probability of receiving the (given) expected net return \((X - \xi (E_\alpha^a D_t)^2)\). The third term captures the negative marginal impact of increased forecasts on the punishment for the lost reputation (since deficit will be increasing) given the chance of winning the elections.

The optimal (overly optimistic) choice of its state-specific growth forecast is determined by first order condition (14). The mechanism is similar to the one in Shi and Svensson’s (2006) political budget cycle model. There is moral hazard because a hidden effort (deficit in Shi and Svensson; and forecasts here) is used by the government for expanding fiscal latitude and trying to improve re-election chances. But how is the government’s optimal choice of its forecast manipulation affected by exogenous aspects of the model? Some of the (straightforward) perturbation results (reported in Appendix E) are also the same as in Shi and Svensson; higher social costs of incurring a deficit reduce the manipulation; higher benefits of being in office increase the manipulation. Other results differ because retrospective voting is distinguished from rational voting here, whereas the Shi and Svensson (2006) model only captures rational voting; Propositions 1 and 2 are discussed in the next section (Section 4). Then, Section 5 evaluates the effect of government recession expectations (Proposition 3).
4 Uninformed Voters: Retrospective Versus Rational Voting

Informed voters can observe the incumbent’s actions and infer her competence. It makes sense that they vote rationally, i.e. choose the most competent policymaker. The situation is different when voters are uninformed. In Shi and Svensson (2006), for instance, the government would increase the deficit in order to cheat on voters because they are uninformed and can, therefore, not observe the deficit ex ante. Nonetheless, those same uninformed voters are assumed to be able to rationally anticipate the correct deficit in equilibrium. This is the standard rational expectations assumption, but it is applied to uninformed voter. That is why there are conceptual objections. Grossman (1977), for instance, argues that informed and uninformed agents must hold different beliefs in equilibrium. His assertion was made in the context of a financial market model. According to Grossman, informed and uninformed agents can only hold identical beliefs in equilibrium, if there is an observable economic variable, which contains the entire information the uninformed agent could otherwise not have observed. In his model, a price may (or may not) fulfil this role, but in Shi and Svensson’s (2006) model there is no such variable which would allow the uninformed voters to extract the relevant information.

Such a model logic of rational voting by uninformed voters produces a result which contradicts empirical findings. In Shi and Svensson (2006), for instance, the government does manipulate the deficit, but cannot increase its re-election chances. Furthermore, it wants to manipulate more when the share of uninformed voters goes up, but, again, without being able to raise electoral support. The same happens in this model, if we assume rational expectations, i.e. uninformed voters’ perception of the state government’s forecast, $\hat{\epsilon}^a_t$, corresponds – in equilibrium – to the government’s optimal forecast, $(\epsilon^a_t)^*$. It implies that

13 In the signalling models by Rogoff and Sibert (1988) and Rogoff (1990), for instance, it is possible to affect re-election chances in principle. However, this is not necessary or not possible, respectively, if the incumbent is very competent or very incompetent – a model result which does not corroborate with the aforementioned evidence on the positive effect of political manipulations on voting outcomes. – A totally different point of view is taken by Brender (2003) who argues that refraining from short-termism may actually increase a politician’s re-election chance. In an empirical study of Israeli local elections he can show that responsible fiscal policies had a significant positive effect in the 1998 local elections, though not in two prior elections.
the probability of being elected specified in equations (11) and (12) remains unchanged at 50%. This is an artifact of the model which contradicts empirical findings. According to Akhmedov and Zhuravskaya (2004) and Aidt, Veiga and Veiga (2011) economic machinations positively influence re-election chances. Boylan (2008) and Aidt, Veiga and Veiga (2011) even find evidence for a "close election bias", i.e. that government manipulations increase, if the election is closely contested.

In this model, forecast manipulations affect the incumbent’s re-election chances, as soon as some voters underestimate the manipulation, i.e. $\tilde{e}_t^a < (e_t^a)^*$. In equations (11) and (12), the probability of being elected increases above 50%. This is what retrospective voting by uninformed voters does. They falsely attribute the improved fiscal position of the incumbent state government to her competence not suspecting any manipulation. Hence they assume that the incumbent forms a realistic state-specific growth forecast which is lower than the manipulated forecast actually produced by the government. Any linear combination between rational and retrospective voting by uninformed voters produces the same result, qualitatively. How much political support increases depends, however, on the magnitude of the wedge between the expectations of forecast manipulation and the actual degree of the manipulation.

Another difference between rational and retrospective voting is summarised in the following proposition.

**Proposition 1 - The Share of Uninformed Voters.**

A larger share of uninformed voters $\psi$ increases the optimal growth forecast by the state government at the equilibrium, if uninformed voters vote rationally which implies forming rational expectations in equilibrium. However, if they vote retrospectively, the result becomes ambiguous.

\[
(i) \quad \frac{d(e_t^a)^*}{d\psi} > 0, \text{ if } \tilde{e}_t^a = (e_t^a)^*; \quad (ii) \quad \frac{d(e_t^a)^*}{d\psi} = ?, \text{ if } \tilde{e}_t^a < (e_t^a)^*.
\]

**Proof:** Appendix D.
Result (i) seems to be the intuitive one; more people who can be manipulated lead to more manipulation by the government. In a different setting, such an effect of uninformed voters on manipulations is also found by Shi and Svensson (2006). However, if voting is no longer fully rational, the effect of increasing the share of uninformed voters is no longer unambiguous as shown by result (ii).  

Even though the share of uninformed voters does not necessarily increase the manipulations, the government would respond to a change of expectations of uninformed voters, if it knew about them.

**Proposition 2 - Uninformed Voters’ Forecast Expectations.**

*If voters expect a higher government growth forecast (\( \hat{\epsilon}_t^a \) up at the equilibrium) and the government knows it, then it is optimal for the state government to increase its growth forecast.*

\[
\frac{d(\hat{\epsilon}_t^a)^*}{d\epsilon_t^a} > 0.
\]

**Proof:** Appendix D.

Suppose the voting behaviour by uninformed voters is anything between retrospective and rational. If the government anticipates an increase in the uninformed voters’ perception of the state government’s growth forecast, the government will respond by increasing the deliberate forecast manipulation even further. The proposition even covers the situation that uninformed voters are overdoing their scepticism by expecting a growth forecast manipulation beyond the government’s optimal choice. If known by the government, it would, again, be optimal for the government to extend its manipulation. Whatever the situation,

\[14\] In a similar setting, this has already been found by Bohn (2011). That paper argues that it depends on the elasticity of the competence distribution function at the equilibrium. Intuitively, the key point is that the competence distribution function actually determines how effective government manipulations are in increasing the incumbent’s re-election chances. Here, a similar sufficient condition can be obtained (and is reported in appendix D) for the counterintuitive result that an increase in the share of uninformed voters leads to less forecast manipulation by the government.
an increase in the uninformed voters’ perception of the state government’s growth forecast implies a reduction of electoral support (see equations 11 and 12). Hence the government reoptimises by accepting more costly deficit in order to raise the probability of re-election.

5  Recession Expectations by the Government

It is almost commonplace now that ”Recession and Re-election Don’t Mix” (Rosenbaum, 1991). The title was chosen by The New York Times at the occasion of recession fears prior to the upcoming re-election campaign of George Bush (sen.) and potential problems for Bush’s advisors to find ”ways to boost the economy for their political advantage in an election year”. If all voters fully adjusted their expectations to an upcoming recession, economic downturns would not have a negative effect for re-elections as suggested by the New York Times. In reality, it is unlikely that all voters adjust their expectations of government policy as soon as state-specific recession tendencies are discussed in the media. In this paper, it is, therefore, assumed that the government has an information advantage over a part of the electorate, say the uninformed voters. The question is then how an opportunistic government can manipulate policies in the face of its own recession fears knowing that part of the electorate will attribute a bad economy to bad government policies. Boylan (2008) suggests that ”government officials can avoid choosing between raising taxes and cutting government programs by making optimistic forecasts when the economy is headed for a downturn.” The next proposition shows how typically optimistic forecasts (based on a steady economy as discussed before) will be adjusted to cushion the effects of an expected recession.

Proposition 3 - Recession (or Boom) Expectations.

Imminent recession expectations by the government (lower $E_i^e[\epsilon_t]$ in equation 13) decrease the government’s optimal growth forecast at the equilibrium, but underproportionally. (Analogously, boom expectations increase optimal growth forecasts, but, again, underproportion-
ally.

\[ 0 < \frac{d(\epsilon_i^a)^*}{dE_t^a[\epsilon_t]} < 1; \]  \hspace{1cm} (15)

\textit{Proof:} Appendix D.

If we perturb the equilibrium so that the government expects a downturn (reduced expected state-specific growth \( E_t^a[\epsilon_t] \)), it reduces its state-specific growth forecast \( \epsilon_t^a \), but not as much as \( E_t^a[\epsilon_t] \) goes down. Hence the state government’s growth forecast will be even more optimistic relative to the government’s realistic growth expectations. This means that the government also expects to run an even higher deficit. An anticipated recession leads to an amplified budget cycle. This amounts to countercyclical policies, but for the wrong reasons, namely that an opportunistic incumbent tries to manipulate forecasts and fiscal policies in order to ensure her own re-election.\(^{15}\)

Suppose the voting behaviour by uninformed voters is anything between retrospective and rational. Perturbation of the incumbent’s expectations can be understood as a private information signal the government receives, but uninformed voters do not. Hence uninformed voters will not alter their perception of the government’s state growth forecast.\(^{16}\) But why will the government adjust as suggested in Proposition 3? Suppose the government did not adjust its state-specific growth forecast \( \epsilon_t^a \), but state growth was indeed lower. Then the deficit would increase, but that would be costly. So it would have been optimal for the government to reduce its growth forecast \( \epsilon_t^a \). However, a reduction of \( \epsilon_t^a \) means accepting lower electoral support (since \( \hat{\epsilon}_t^2 \) does not change in equations 11 and 12). Thus, the government wants to re-optimize by trading off deficit costs for loss of re-election probability;

\(^{15}\) In an empirical study on sub-Saharan African countries, Diallo (2009) finds that democratic institutions make fiscal policies countercyclical. He suspects, but cannot find empirically, that political business cycles produce procyclical policies. This paper argues that political forecast cycles contribute to countercyclical policies, at least on a state level in industrial countries.

\(^{16}\) Even rational uninformed voters, who took their decision on the basis of the original information set, should not be able to revise their decision now. – For informed voters, it is irrelevant, if they receive the signal or not because they can observe the state government’s growth forecast anyway.
and it chooses to reduce its growth forecast $\epsilon_t$ only underproportionally in order to preserve a sufficiently positive effect on its re-election chances.\textsuperscript{17}

**Corollary 1 - The Effect on Debt.**

*If imminent recession expectations by the government (lower $E_t^\alpha[\epsilon_t]$) are justified, the actual deficit at the equilibrium increases [decreases with boom expectations].*

\[
\frac{dD}{dE_t^\alpha[\epsilon_t]} < 0.
\]

Given that the government responds underproportionally to an expected downturn or upturn (Proposition 3), the corollary follows directly from equations (8) and (7). Essentially, the corollary says that political opportunism encourages the government to run countercyclical policies, at least during election years. (Note, however, that the deficit would be reduced (augmented), if the recession (boom) expectations did not materialise.)

In the real world, the countercyclicality result could be stronger. In this model, a deficit is also costly because of the exogenous reputation costs the government suffers in the following period according to equation (2). However, voters will probably not punish the government so much for having missed the balanced budget requirement ex post, if it turns out that it happened during a recession. As deficits are less costly, this will reinforce the incumbent’s willingness to use overly optimistic forecasts for facilitating an expansionary policy during a recession.

The effect of *expected recessions* on the political forecast and budget cycle has largely been ignored in the literature thus far. Boylan (2008) tries to capture the effect of actual recessions on forecasts by including changes in *actual* unemployment, income and inflation. However, he cannot test, if recessionary *expectations* affect the magnitude of forecast manipulations. Kamlet, Mowery and Su (1987) find that actual recessions affect long-run, but not short-run

\textsuperscript{17} If the expected recessionary shock is too large, not even that may be possible. This would be the case, if the government’s optimal choice turned out to be a negative state-specific growth forecast. This would also imply a negative provision of transfers ($T_t^{s+} < 0$).
forecasts. However, their results are based on federal US data (where only a soft fiscal limit applies) and not on data for US states (where constitutional balanced budget constraints are in place). It may not be straightforward to extract data for true expectations by state governments on their economic outlook, because the data published by the states is exactly what we suspect of being, intentionally, too optimistic. In the US context we might be able to use the national economic outlook (which is known to be less biased) and break it down to the state level. This would, however, require the use of specific state level economic indicators as well as some understanding the state level dynamics of US business cycles (see, for instance, Magrini, Gerolimetto and Duran, 2013). On this basis, it might be possible to construct a panel data set for testing the theoretical prediction that expected recessions amplify forecast and budget cycles.

6 Conclusion

The paper offers a theoretical explanation for political distortions found in forecasts by US states (Boylan, 2008). Based on overly optimistic revenue forecasts the incumbent state government can conduct expansionary fiscal policies in order to appear more competent prior to an upcoming election. Since the resulting deficit can only be observed afterwards, the government can effectively circumvent a constitutional balanced budget constraint. As a result, there are political forecast and budget cycles. However, the paper also derives a much more specific result which picks up a suspicion already raised by Boylan (2008). If the government perceives a downturn to be imminent, it may be particularly keen on producing too optimistic forecasts in order to avoid increases in taxes or cuts in spending programmes just before the election. If there are boom expectations, forecast optimism may be dampened. Overall, political opportunism thus produces, unintentionally, countercyclical policies. Despite having clear empirical implications this finding has largely been ignored in the literature thus far.

Other results depend on the voting assumptions for uninformed voters. Retrospective voting
presupposes total naivety by uninformed voters. Rational voting is conceptually unsatisfactory because it implies that informed and uninformed voters have the same beliefs in equilibrium (Grossman, 1977). It also produces the result that forecast and budget manipulations cannot raise the incumbent’s re-election chances – which contradicts evidence found by Akhmedov and Zhuravskaya (2004) and Aidt, Veiga and Veiga (2011). A linear combination between retrospective and rational voting seems more reasonable. But then an intuitive finding by Shi and Svensson (2006) does no longer hold unambiguously; instead, raising the share of uninformed voters does not necessarily increase the incumbent’s optimal choice of political (forecast and/or budget) manipulation.

The assumptions of this paper are tailored to the situation in US states, but may also apply, for instance, to German states (Länder) once the constitutional debt brake will be implemented by 2020. The assumption that part of the electorate cannot observe the state-specific growth forecast by the state budget office is, arguably, more realistic than assuming that a share of voters does not know about national forecasts. However, even on a national level, it is hardly conceivable that all voters are fully informed. Therefore, the results may have some bearing on European countries where similar (constitutional) balanced budget constraints are or will be in place. Debt brakes in Switzerland (from 2003) and Germany (from 2016), for instance, focus on the deficit; those in Poland, Spain, Italy and Austria, for instance, on the 60% debt-to-GDP ratio; all of them envisage some flexibility though.

Further research will be required to be able to capture the situation in those EU countries which committed to adopting the European Fiscal Compact as of 2013. Modelling the specific situation in US states may have been a first step.

**Appendix and Indications for the Referees**

The appendix presents indications for the model solution in Section 3 and for the derivation of the propositions in Sections 4 and 5.
A Probability of individual to vote for the incumbent

First, we consider an individual voter, no matter if informed or uninformed. She votes for incumbent $a$, if

$$E_t[c_{t+1}^a + \alpha \theta^i(-\frac{1}{2})] > E_t[c_{t+1}^b + \alpha \theta^i(\frac{1}{2})].$$

Exp. utility when $a$ in power \hspace{1cm} Exp. utility when $b$ in power

Depending on who is in power, $t+1$ consumption will typically differ because of differences in policymakers’ competence and individuals’ expectations about it:

$$E_t[c_{t+1}^a] = E_t[y_t] + E_t[(1 - \tau)\epsilon_{t+1}^a y_{t+1}] + E_t[T_{s+t}^a];$$ \hspace{1cm} (A.2)

$$E_t[c_{t+1}^b] = E_t[y_t] + E_t[(1 - \tau)\epsilon_{t+1}^b y_{t+1}] + E_t[T_{s+t}^b];$$ \hspace{1cm} (A.3)

$$E_t[T_{s+t+1}^a] = E_t[\tau \epsilon_{t+1}^a y_{t+1}] - (1 + r_t)D_t + E_t[\eta_{t+1}^a], \hspace{1cm} j = a, b.$$ \hspace{1cm} (A.4)

Equation (A.4) says that the period $t$ deficit must be repaid in period $(t + 1)$. However, the policymaker will try not to borrow in period $(t + 1)$ because there is no election at the end of that period. (Note that they will probably end up with a deficit or surplus though. See also the discussion in the subsection on the timing of events on page 11.) The best growth forecast for the incumbent in $(t + 1)$ is, therefore, $\epsilon_{t+1}^a = E[\epsilon_{t+1}] = 0$. As a result, state-specific transfers in $(t + 1)$ are negative (i.e. taxes) corresponding to deficit repayment modulo the effect of the policymaker’s competence. Individuals have no idea about the skills shock of either potential policymaker in $t + 1$. Nor do they know the skills shock of the challenger in period $t$, and, therefore, expect 0. However, they can use the incumbent’s period $t$ transfer policy to draw conclusions about her skills shock in period $t$ (not shown here, but further down; the difference between informed and uninformed voters will then be exploited).

$$E_t[T_{s+t+1}^b] = -E_t[(1 + r_t)D_t];$$ \hspace{1cm} (A.5)

$$E_t[T_{s+t+1}^a] = -E_t[(1 + r_t)D_t] + E_t[\mu_t^a];$$ \hspace{1cm} (A.6)

where $D_t$ denotes the deficit according to equation (7). It is a result of the difference of realised state-specific growth $\epsilon_t$ and the incumbent’s optimal choice for the period $t$ state-specific growth forecast $\epsilon_t^a$ (to be determined further down). It is the same for both policymakers, even if the incumbent were to lose the elections. Combining equations (A.1) to
(A.6) we can obtain a condition for an individual to vote for incumbent $a$ (which corresponds to condition 9 in the main text):

$$E_t[\mu_t^a] > \alpha \theta^i.$$  

(A.7)

Using the distribution of the skills shock we can determine the probability ($Pr$) of any voter, be she informed or uninformed, to vote for incumbent $a$:

$$Pr[E_t[\mu_t^a] - \alpha \theta^i \geq 0] = \frac{E_t[\mu_t^a] - (-\alpha)}{\alpha - (-\alpha)} = \frac{E_t[\mu_t^a]}{2\alpha} + \frac{1}{2}. \quad (A.8)$$

### B Probability of incumbent to win

Now, we can determine the probability $Prob$ that incumbent $a$ obtains 50% of the votes in the period $t$ elections. It is the probability that the number of voters times their individual probability $Pr$ to vote for incumbent $a$ (as determined in equation A.8) is greater or equal to $\frac{1}{2}$. However, the individual probability $Pr$ is different for informed and uninformed voters because their expectations of period $t$ skills, $E_t[\mu_t^a]$, differ. The probability for the incumbent to win the election – equation (10) in the main text – is repeated here:

$$Prob \left\{ \begin{array}{l}
(1 - \psi) \left[ \frac{E_{inf_t}[\mu_t^a]}{2\alpha} + \frac{1}{2} \right] + \psi \left[ \frac{E_{uninf_t}[\mu_t^a]}{2\alpha} + \frac{1}{2} \right] \geq \frac{1}{2} \\
\text{informed} \hspace{2cm} \text{uninformed}
\end{array} \right\}. \quad (B.1)$$

So why is there a difference in expectations for informed and uninformed voters? Rewrite the government transfer equations (4) and (5) for period $t$:

$$T_{t+}^s = \tau \epsilon_t^a y_t - (1 + r_{t-1}) D_{t-1} + \mu_t^a + \mu_{t-1}^a. \quad (B.2)$$

For informed voters we obtain:

$$E_{inf_t}[\mu_t^a] = \mu_t^a = T_{t+}^s - \tau \epsilon_t^a y_t + (1 + r_{t-1}) D_{t-1} - \mu_{t-1}^a. \quad (B.3)$$

State-specific transfers $T_{t+}^s$, previous period deficit $D_{t-1}$, previous period competence $\mu_{t-1}^a$, national (per person) income $y_t$, interest rate $r$ and the tax rate $\tau$ can be observed by everybody. The point is that informed voters can determine $E_{inf_t}[\mu_t^a]$ deterministically, because they can also observe the incumbent’s state-specific growth forecast, $\epsilon_t^a$. By contrast,
uninformed voters must form an estimate of the incumbent’s skills, $\hat{\mu}_a^i$, based on their perception of the state government’s growth forecast $\hat{\epsilon}_i^a$:

$$E_{\text{uninf}}[\mu^a_i] = \hat{\mu}_i^a = T_{i}^{s^+} - \tau\hat{\epsilon}_i^a y_t + (1 + r_{t-1}) D_{t-1} - \mu_{i-1}^a$$

$$= \frac{T_{i}^{s^+} - \tau\hat{\epsilon}_i^a y_t + (1 + r_{t-1}) D_{t-1} - \mu_{i-1}^a + \tau\epsilon_i^a y_t - \tau\hat{\epsilon}_i^a y_t;}{\mu_i^a \text{ from (B.3)}}$$

$$E_{\text{uninf}}[\mu^a_i] = \mu_i^a + \tau(\epsilon_i^a - \hat{\epsilon}_i^a) y_t. \quad (B.4)$$

Uninformed voters overestimate the incumbent’s competence by $\tau(\epsilon_i^a - \hat{\epsilon}_i^a) y_t$. Using equations (B.3) and (B.4) we can now determine the probability $\text{Prob}^{\text{win}}$ that incumbent $a$ receives 50% of the votes in period $t$:

$$\text{Prob}^{\text{win}} = \text{Prob}\left\{ \left(1 - \psi\right) \left[ \frac{\mu_i^a}{2\alpha} + \frac{1}{2} \right] + \psi \left[ \frac{\mu_i^a + \tau(\epsilon_i^a - \hat{\epsilon}_i^a) y_t}{2\alpha} + \frac{1}{2} \right] \geq \frac{1}{2} \right\}$$

$$= \text{Prob}\left\{ \frac{\mu_i^a}{2\alpha} + \psi \frac{\tau(\epsilon_i^a - \hat{\epsilon}_i^a) y_t}{2\alpha} + \frac{1}{2} \geq \frac{1}{2} \right\}.$$ (B.5)

$$\text{Prob}^{\text{win}} = \text{Prob}\{ \mu_i^a \geq \psi \tau(\hat{\epsilon}_i^a - \epsilon_i^a) y_t \};$$ (B.5)

$$\text{Prob}^{\text{win}} = 1 - F\left[ \psi \tau(\hat{\epsilon}_i^a - \epsilon_i^a) y_t \right],$$ (B.6)

where $F(\bullet)$ is the distribution function of the skills shock.

Figure 2: Bell-shaped competence density function as an example

The marked area towards the right (light grey or yellow [if in colour]) under the density function depicted in the figure corresponds to the probability described by equation (B.5) and by the distribution function representation in equation (B.6). The expected competence overall (combine equations B.3 and B.4) is always greater than the actual competence, if the government’s state-specific growth estimate perceived by uninformed voters is smaller than the actual government growth estimate ($\hat{\epsilon}_i^a < \epsilon_i^a$). Then the probability (see equation (12) or the light grey [or yellow] area under the density function) is always greater than $\frac{1}{2}$. We can see that expanding fiscal latitude by choosing an overly optimistic state-specific
growth forecast increases the government’s chance to be re-elected. A similar effect occurs, if uninformed voters were to reduce their perception of the government growth forecast for some reason.

C Incumbent’s maximisation problem

Now, we can maximise incumbent $a$’s utility over the entire election cycle, i.e. periods $t$ and $t+1$. Period $t+1$ utility is the sum of the utilities for winning and losing the election weighted by the probability determined the previous step:

\[
\max_{\epsilon_t^a} V = \max_{\epsilon_t^a} V_t^a + V_{t+1}^a =
\]

\[
\max_{\epsilon_t^a} \quad \mathbb{E}_t^a \{ y_t + (1 - \tau)\epsilon_t y_t + \tau \epsilon_t^a y_t - (1 + r_{t-1})D_{t-1} + \eta_t^a + X - \xi D_{t-1}^2 \} \quad (\text{eq. 4 and 5})
\]

\[
+ \mathbb{E}_t^a \{ [1 - F[\psi \tau (\epsilon_t^a - \epsilon_t) y_t]] \text{ prob. incumbent wins} \}
\]

\[
[y_t + (1 - \tau)\epsilon_t y_t + \tau \epsilon_t^a y_t - (1 + r_{t-1})D_{t-1} + \eta_t^a + X - \xi D_{t-1}^2] \quad (\text{eq. 4 and 5})
\]

\[
+ \mathbb{E}_t^a \{ [F[\psi \tau (\epsilon_t^a - \epsilon_t) y_t]] \text{ prob. incumbent loses} \}
\]

\[
[y_t + (1 - \tau)\epsilon_t y_t + \tau \epsilon_t^a y_t - (1 + r_{t-1})D_{t-1} + \eta_t^a + X - \xi D_{t-1}^2] \quad (\text{eq. 4 and 5})
\]

Next, substitute in for the expected current debt ($\mathbb{E}_t^a[D_t] = \tau(\epsilon_t^a - \mathbb{E}_t^a[\epsilon_t]) y_t - (1 + r_{t-1})(D_{t-1})$); simplify expectations when they are zero (expectations of the future growth rate shock, $\mathbb{E}_t^a[\epsilon_{t+1}] = 0$; and expectations of the optimal future growth rate forecast, $\mathbb{E}_t^a[\epsilon_{t+1}^a] = \mathbb{E}_t^a[\eta_{t+1}^a] = 0$); and acknowledge that the incumbent knows her past, but not her present and future skills, nor the skills shock of the challenger ($\mathbb{E}_t^a[\mu_{t+1}^a] = \mathbb{E}_t^a[\mu_{t+1}] + \mathbb{E}_t^a[\mu_t] = \mathbb{E}_t^a[\mu_{t-1}]$; and $\mathbb{E}_t^a[\eta_{t+1}^a] = \mathbb{E}_t^a[\eta_{t+1}] = 0$). Now, the maximisation problem looks as follows:

\[
\max_{\epsilon_t^a} \quad y_t + y_{t+1} + E_t^a[\epsilon_t] y_t - r_t \tau (\epsilon_t^a - E_t^a[\epsilon_t]) y_t + r_t (1 + r_{t-1})D_{t-1} + \mu_{t-1} + X - \xi D_{t-1}^2
\]

\[
+ [1 - F[\psi \tau (\epsilon_t^a - \epsilon_t) y_t]] [X - \xi [\tau (\epsilon_t^a - E_t^a[\epsilon_t]) y_t - (1 + r_{t-1})D_{t-1}^2]]. \quad (\text{C.2})
\]

Having verified the second order condition for a well-behaved maximisation problem we can work from the following first order condition, a condensed version of which is given as
equation (14) in the main text:

\[ -r_t \tau y_t + F'[\psi \tau (\hat{\epsilon}_a - \epsilon_a^\ast) y_t] \psi \tau y_t [X - \xi [\tau (\epsilon_a^\ast - E_t^a[\epsilon_t]) y_t - (1 + r_{t-1}) D_{t-1}]]^2 
- [1 - F[\psi \tau (\hat{\epsilon}_a - \epsilon_a^\ast) y_t]] 2\xi \tau y_t [\tau (\epsilon_a^\ast - E_t^a[\epsilon_t]) y_t - (1 + r_{t-1}) D_{t-1}] = 0, \]  
(C.3)

where \( F'[\bullet] = f[\bullet] \) refers to the probability density function.

D Perturbation Results for Propositions

Perturbation results in Appendix E and in the Propositions of Sections 4 and 5 are obtained by using the Implicit Function Theorem. The derivations of the marginal effect of changes in exogenous variables on the equilibrium value of the government’s optimal choice of the state-specific growth forecast \((\epsilon_a^\ast)^*\) are given here:

Proposition 1:

\[
\frac{d(\epsilon_a^\ast)^*}{d\psi} = -\frac{V_{\epsilon_a^\ast \psi}}{V_{\epsilon_a^\ast \epsilon_a^\ast}} \text{?} > 0, \text{ if } \hat{\epsilon}_t^a = (\epsilon_a^\ast)^* \text{ [rational expectations in equilibrium]}
\]

or if \( \hat{\epsilon}_t^a \) sufficiently close to \((\epsilon_a^\ast)^*\)

\[
( < 0, \text{ if } \frac{F'[\bullet]}{F''[\bullet]} < ((\epsilon_a^\ast)^* - \hat{\epsilon}_t^a) \psi \tau y_t). \]

Proposition 2:

\[
\frac{d(\epsilon_a^\ast)^*}{d\hat{\epsilon}_t^a} = -\frac{V_{\epsilon_a^\ast \hat{\epsilon}_t^a}}{V_{\epsilon_a^\ast \epsilon_a^\ast}} > 0.
\]

Proposition 3:

\[
\frac{d(\epsilon_a^\ast)^*}{dE_t^a[\epsilon_t]} = -\frac{V_{\epsilon_a^\ast E_t^a[\epsilon_t]}}{V_{\epsilon_a^\ast \epsilon_a^\ast}} > 0, \text{ but } < 1 
\]

\[
( > 0, \text{ but } < 1, \text{ even if } \hat{\epsilon}_t^a = (\epsilon_a^\ast)^* \text{ [rational exp. in eq.]}). \]

E Straightforward Results Referred to at the End of Section 3

1. Government Cost Effect: Higher repayment costs \( r_t \) and higher reputation costs \( \xi \) reduce the optimal growth forecast by the state government at the equilibrium:

\[
(i) \quad \frac{d(\epsilon_a^\ast)^*}{dr_t} = -\frac{V_{\epsilon_a^\ast r_t}}{V_{\epsilon_a^\ast \epsilon_a^\ast}} < 0; \quad (ii) \quad \frac{d(\epsilon_a^\ast)^*}{d\xi} = -\frac{V_{\epsilon_a^\ast \xi}}{V_{\epsilon_a^\ast \epsilon_a^\ast}} < 0.
\]
2. Government Benefit Effect: A higher ego rent $X$ increases the optimal growth forecast by the state government at the equilibrium:

\[
(iii) \quad \frac{d(c_i^a)^*}{dX} = -\frac{V_{\epsilon a}X}{V_{\epsilon a}^2} > 0.
\]

3. Leverage Effect: A higher tax rate $\tau$ and a higher national income $y_t$ decrease the optimal growth forecast by the state government at the equilibrium:

\[
(iv) \quad \frac{d(c_i^a)^*}{d\tau} = -\frac{V_{\epsilon a}^2\tau}{V_{\epsilon a}^3} < 0; \quad (v) \quad \frac{d(c_i^a)^*}{dy_t} = -\frac{V_{\epsilon a}y_t}{V_{\epsilon a}^3} < 0.
\]

As for part 1, if the cost of manipulating the government’s state-specific growth forecast increases, the government will be more careful in expanding fiscal latitude in order to gain an electoral advantage. The effect of increasing the social costs of deficits was already captured in the different setting of the Shi and Svensson model, though not explicitly. An analogous result is obtained with respect to an increase in reputation costs. As for part 2, the incumbent is willing to increase the manipulation, if there is a larger benefit from being re-elected. This implies that the government accepts additional costs of producing a deficit caused by the expansion of fiscal latitude, which, in turn, is the result of announcing a more optimistic government growth forecast. Despite the model differences, such an effect of ego rents on manipulations is also confirmed by Shi and Svensson (2006). In part 3, as $\tau$ or $y_t$ increase, the effect of a government’s growth forecast manipulation on fiscal latitude as well as on the deficit becomes larger. So the government should reduce its state-specific growth forecast to achieve the same optimal level of fiscal latitude. (The marginal effects with respect to $\tau$ and $y_t$ are the same.) This leverage effect is not captured in Shi and Svensson (2006) because the increase in fiscal latitude is obtained in their model by manipulating the deficit directly. Here, the deficit is obtained residually.

References


